A Report Prepared for

United States Navy
Western Division
Naval Facilities Engineering Command
P.O. Box 727
San Bruno, California 94066-0720

OFFICERS' CLUB INVESTIGATION
NAVAL STATION, TREASURE ISLAND
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

HLA Job No. 02176,160.02

by

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Staff Geologist II

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7655 Redwood Boulevard
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November 2, 1988

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1.0 INTRODUCTION

This report presents the results of Harding Lawson Associates' (HLA) investigation of the Officers' Club at the Naval Station, Treasure Island, Hunters Point Annex (HPA), San Francisco, California (Plate 1).

The Navy has indicated that the landscaped area in front of the Officers' Club at HPA may be contaminated with sandblast waste and oily materials. In the past, personnel (Navy and/or contractors) have reported oil-stained soil in this area.

The objectives of this investigation were to: 1) verify the existence of contamination; 2) assess whether an immediate threat to the public health or environment exists; and 3) identify potential response actions, if any, that might mitigate possible hazards. The results presented herein provide a preliminary screening of conditions existing at the Officers' Club site at the time of sampling, and are limited to those areas in the immediate vicinity of the sampling locations. The area of investigation is shown on Plate 2.

The scope of the investigation consisted of collecting and analyzing three soil samples from two areas in front of the Officers' Club and preparing this report.

2.0 FIELD INVESTIGATION

Three soil samples were collected on May 17, 1988, from two grass-covered parking medians south of the Officers' Club - Building 901 (Plate 2) at HPA. These locations were chosen based on verbal reports from the Navy and a site reconnaissance visit. The HPA Site Safety Plan (SSP) (*HLA, 1988a*) procedures were followed during this investigation. At the sampling locations in Median 1, the grass and sandy top fill were excavated with a shovel to a depth of six inches. At a depth of six inches, black plastic sheeting was encountered. The black plastic was cut open to expose the underlying soil, a dark silty sand with some clay. At each of Locations OC01 and OC02, a 6-inch-long, 3-inch-diameter stainless steel tube was driven vertically 6 inches into the underlying soil (a depth of 6 to 12 inches) using a handle-mounted drive shoe struck with a 4-pound hand sledge. The sample tubes were removed from the ground with a shovel, yielding full sample recovery. The ends of the tubes were covered with aluminum foil and plastic caps and sealed with PVC electrical tape. The samples were labeled, placed in plastic ziplock bag, and stored in an ice chest with blue ice (cooled to approximately 4°C) and delivered to the laboratory at the end of the day.

The third soil sample was a composite soil sample (OC03) collected from two locations inside Median 2. The grass and sandy top fill at this location was excavated to a depth of 12 inches; plastic was not encountered at either location in Median 2. Approximately 1 kilogram (kg) of tan to dark sand with some silt was collected from each location and mixed thoroughly in a plastic bucket. The soil from this mixture was manually packed into a 6-inch-long, 3-inch-diameter stainless steel tube. The composited sample was then sealed and stored as previously described.

Prior to sampling, the sampling equipment was cleaned using a high pressure hot water washer (steam cleaner). Between each sample collection, sampling equipment was

cleaned with an Alconox wash and deionized water rinse following the decontamination protocol described in Section 12.0 of the Quality Assurance Project Plan (QAPP) (*HLA, 1988b*).

A field water blank (OC04) was prepared at the HLA field office at HPA by decanting deionized water from a clean glass pint jar into the appropriate laboratory-supplied sample containers for the specified analyses. This blank was transported to the laboratory in the same ice chest as the samples. The purpose of this blank was to evaluate if there was a possibility of contamination during transport of the samples.

Chain of custody forms were completed in the field as specified in Section 13.0 of the QAPP (*HLA, 1988b*). The samples were delivered to Curtis and Tompkins, Ltd analytical laboratory at the end of the day.

3.0 CHEMICAL ANALYSES AND RESULTS

The three soil samples collected from the parking medians in front of the Officers' Club were analyzed for semivolatile organic compounds (EPA Test Method 8270), organochlorine pesticides and PCBs (EPA Test Method 8080), total petroleum hydrocarbons (TPH; EPA Test Method 3550/8015), and the CAM metals (EPA Test Methods 7040, 6010, 7080, 7090, 7470, and 7840). Metals were detected in each sample. PCB 1254 [0.7 milligrams per kilogram (mg/kg)] and an unidentifiable oil compound were detected in composite sample OC03. Table 1 presents the detected analytes (metals, TPH, and PCBs) from the Officers' Club soil samples. No other analytes were detected. The laboratory reports and chain of custody form is presented in the Appendix A. Curtis and Tompkins, Ltd, analyzed the samples in either their Los Angeles or San Francisco branch depending on the branch's certification for the specific analyses.

4.0 DISCUSSION AND RECOMMENDATIONS

Review of the limited site history information and chemical data indicates that the Officers' Club site appears to pose no immediate threat to human health and/or the environment. With a few exceptions, the concentrations of metals detected in these samples are either below or similar to metals concentrations detected in soils representing background conditions at HPA (Table 1). The exceptions are arsenic, cadmium, copper, molybdenum, and selenium which are present at concentrations higher than found at the housing areas. The presence of these metals may indicate contamination from sandblast wastes. The concentration of PCB 1254 is low (near the detection limit). The concentration of the unidentifiable oil compound is not known but visual examination of the soil did not indicate any discoloration that might be expected from high concentrations of oil. Exposure to these compounds in the surface soils is limited because the areas are covered with grass. The vertical extent of PCBs and oil is not known.

At this time, no immediate response action is recommended for this site. However, it is recommended that additional soil samples be collected and analyzed for TPH, oil and grease, and PCBs from depths deeper than were sampled and at different locations. Prior to such additional field work, information from Navy personnel who initially reported the observance of oil-stained soil should be obtained to confirm past reports. In addition, lawn irrigation at this site should be terminated in order to prevent possible downward migration of the chemicals detected in surface soils.

5.0 REFERENCES

HLA, 1988a. *Site Safety Plan, Naval Station, Treasure Island, Hunters Point Annex, San Francisco, California.* January 14.

HLA, 1988b. *Quality Assurance Project Plan (QAPP), Naval Station, Treasure Island, Hunters Point Annex, San Francisco, California.* May 26.

HLA, 1987. *Subsurface Investigation Proposed Housing Areas 1 and 2, Ex-Hunters Point Naval Shipyard, San Francisco, California.*

TABLES

Table 1. Selected Analytical Results
Officers' Club Investigation

Parameter	Detection Limit mg/kg	Sample Locations OC01 mg/kg	OC02 mg/kg	OC03 mg/kg	OC04 (blank) mg/kg	Range of Concentrations from Housing Areas 1 and 2 mg/kg
Antimony	3.0	ND	ND	ND	ND	ND
Arsenic	2.0	49	69	69	ND	ND
Barium	5.0	150	220	84	ND	3.6-218
Beryllium	0.5	ND	ND	ND	ND	ND
Cadmium	0.3	2.4	2.7	2.7	ND	ND
Chromium (total)	0.5	150	182	190	ND	74-884
Cobalt	0.5	25	30	32	ND	39-160
Copper	0.5	16	150	157	ND	4.2-48
Lead	3.0	40	41	43	ND	ND-48
Mercury	0.1	ND	ND	ND	ND	ND-0.08
Molybdenum	0.5	7.4	10	10	ND	ND
Nickel	0.5	300	340	360	0.09	50.6-2500
Selenium	3.0	77	97	100	ND	ND
Silver	1.0	ND	ND	ND	ND	ND
Thallium	3.0	ND	ND	ND	ND	ND
Vanadium	0.5	33	44	46	ND	17.4-78.4
Zinc	0.5	47	48	44	0.03	14.8-66.8
TPH, as Gasoline	10	ND	ND	ND	NT	NT
TPH, as Kerosene	10	ND	ND	ND	NT	NT
TPH, as Diesel	10	ND	ND	ND	NT	NT
Other TPH	NA	--	--	*	--	--
PCB 1254	0.5	ND	ND	0.7	ND	ND

mg/kg = milligrams per kilogram

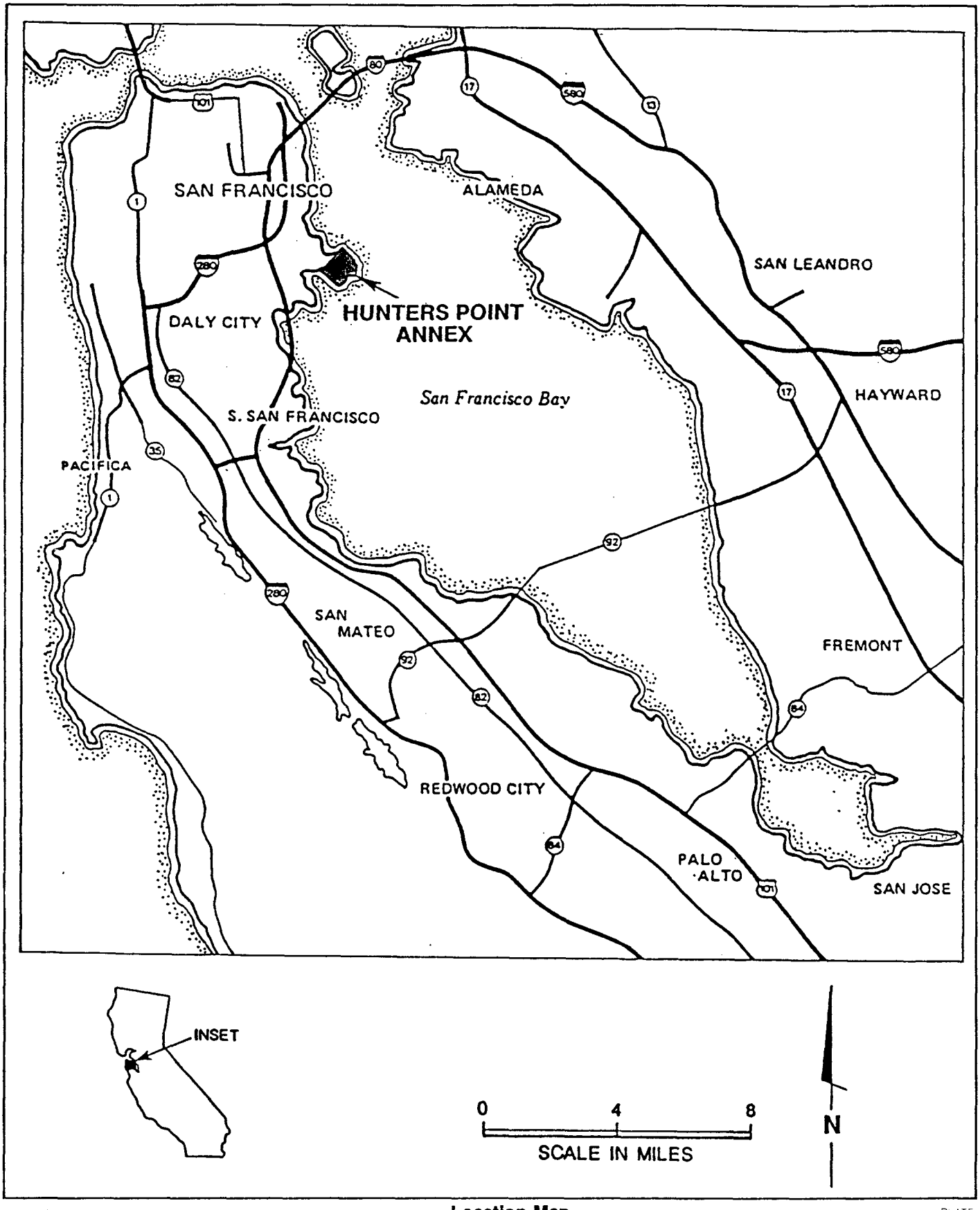
ND = None Detected at given detection limit.

NA = Not Applicable.

NT = Not Tested.

* Contains unidentifiable oil not quantifiable by GC.

ILLUSTRATIONS

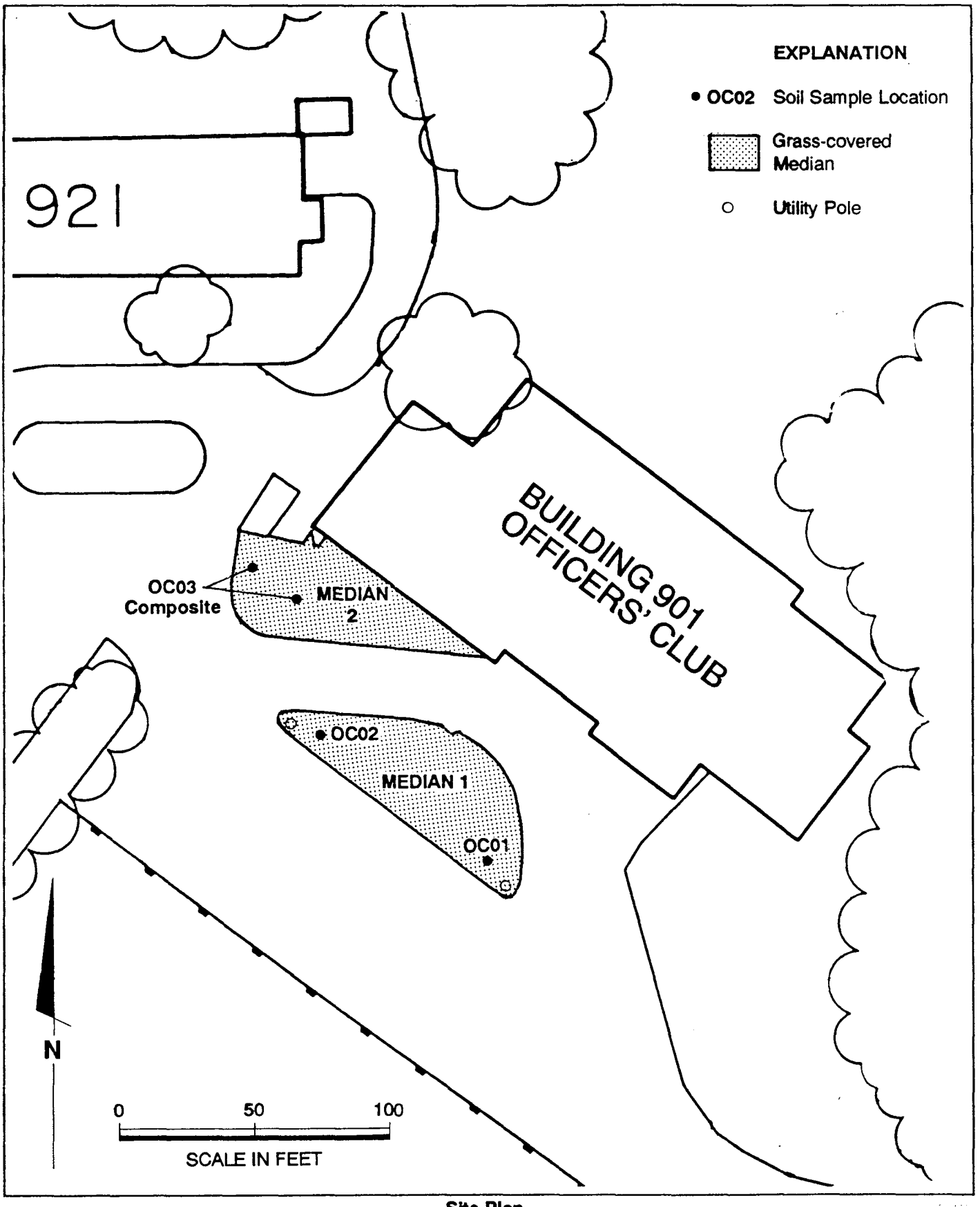


Harding Lawson Associates
Engineers and Geoscientists

Location Map
Officers' Club
Hunters Point Annex
San Francisco, California

PLATE
1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
ML	2176,160.02		6/88		



Harding Lawson Associates
Engineers and Geoscientists

Site Plan
Officers' Club
Hunters Point Annex
San Francisco, California

2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
ML	2176,160.02		6/88		

Appendix

CHAIN OF CUSTODY FORM AND LABORATORY REPORTS

APPENDIX - CHAIN OF CUSTODY FORM AND LABORATORY REPORTS

OFFICERS' CLUB INVESTIGATION

THE ABOVE IDENTIFIED APPENDIX HAS MISSING PAGES. IT COULD NOT BE DETERMINED WHETHER THESE PAGES ARE MISSING OR THE DOCUMENT WAS ISSUED WITHOUT THESE PAGES.

QUESTIONS MAY BE DIRECTED TO:

DIANE C. SILVA
RECORDS MANAGEMENT SPECIALIST
SOUTHWEST
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676

This appendix contains a copy of the chain of custody form and the pages of the laboratory report containing the data for this site. The data included are for the following:

Sample Location	Sample Number	Page Numbers			
		TPH	Metals	SOCs	Pesticides/ PCBs
OC01	8899OC01	1	8	20-21	31
OC02	8899OC02	1	9	22-23	32
OC03	8899OC03	1	10	24-25	33
OC04 (blank)	8899OC04	1	11	18-19	34

Note: Abbreviations are as follows:

TPH = Total Petroleum Hydrocarbons

Metals = California Assessment Manual Metals

SOCs = Semivolatile Organic Compounds

Harding Lawson Associates
Environmental Services Division
200 Rush Landing Road
Novato, California 94947
(415) 892-0821

CHAIN OF CUSTODY FORM

Job Number: 2176.159.163.160.02
Name/Location: Hunters Point
Project Manager: G. Goodman

Samplers: John SKALBECK, Jay Jasperse
Recorder: John Skalbeck (Signature Required)

SOURCE CODE	MATRIX: Sludge	Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	SAMPLE NUMBER OR LAB NUMBER: Yr Wk Seq	DATE: Yr Mo Dy Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Pllnt. Metals (ICP)	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.	EPA 608/8080	Oil / Grease	Cyanide, Sulfide, pH	TPH
80					X	2			88 99 BE 01	88 05 17 09 45	Bldg 123 Sump					X			X			
80					X	2			88 99 BE 02	88 05 17 11 00	Bldg 123 Sump					X			X			
33	X					5			88 99 PH 01	88 05 17 11 45	Pump House				X	X			X	X	X	
33		X				5			88 99 PH 02	88 05 17 12 15	Pump House				X	X			X	X	X	
33		X				5			88 99 PH 03	88 05 17 12 40	Manhole - Pump House				X	X			X	X	X	
48				X		1			88 99 OC 01	88 05 17 14 19	Officers Club				X	X			X			X
48				X		1			88 99 OC 02	88 05 17 14 28	officers Club				X	X			X			X
48				X		1			88 99 OC 03	88 05 17 14 37	officers Club - Comp				X	X			X			X
10		X				5			88 99 OC 04	88 05 17 14 45	Field Blank				X	X			X	X	X	

LAB NUMBER: Yr Wk Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) John Skalbeck	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME 11/14 16:45
METHOD OF SHIPMENT		

Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy Pink

6533

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
290 Division Street, San Francisco, CA 94103, Phone (415) 861-1863

LAB NUMBER: 14724
CLIENT: Harding Lawson Associates
HLA Job #: 2176,159/163/160.02, HUNTERS POINT

DATE RECEIVED: 05/17/88
DATE ANALYZED: 05/19/88
DATE REPORTED: 06/01/88

Results of Analysis for Petroleum Hydrocarbons in Soils & Wastes

Method References: TPH: Total Petroleum Hydrocarbons, EPA 3550/8015

LAB ID	HLA ID	GASOLINE (mg/kg)	KEROSINE (mg/kg)	DIESEL (mg/kg)	OTHER * (mg/kg)
14724-6	8899OC01	ND(10)	ND(10)	ND(10)	
14724-7	8899OC02	ND(10)	ND(10)	ND(10)	
14724-8	8899OC03	ND(10)	ND(10)	ND(10)	*

*CONTAINS UNIDENTIFIABLE OIL NOT QUANITIFIABLE BY GC.

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

Duplicate: Relative % Difference	8
Spike: % Recovery	106

LABORATORY DIRECTOR

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14724-6
CLIENT: Harding Lawson Associates
SAMPLE ID: 88990C01
HLA Job #: 2176,159/163/160.02
HUNTERS POINT

DATE RECEIVED: 05/17/88
DATE ANALYZED: 05/24,27/88
DATE REPORTED: 06/01/88

CAM 17 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	DETECTION LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 7040
Arsenic	49	2.0	EPA 6010
Barium	150	5.0	EPA 7080
Beryllium	ND	0.5	EPA 7090
Cadmium	2.4	0.3	EPA 6010
Chromium (total)	150	0.5	EPA 6010
Cobalt	25	0.5	EPA 6010
Copper	16	0.5	EPA 6010
Lead	40	3.0	EPA 6010
Mercury	ND	0.1	EPA 7470
Molybdenum	7.4	0.5	EPA 6010
Nickel	300	0.5	EPA 6010
Selenium	77	3.0	EPA 6010
Silver	ND	1.0	EPA 6010
Thallium	ND	3.0	EPA 7840
Vanadium	33	0.5	EPA 6010
Zinc	47	0.5	EPA 6010

ND = None Detected

QA/QC SUMMARY

	%RPD	%SPIKE		%RPD	%SPIKE
Antimony	<1	115	Mercury	<1	105
Arsenic	19	105	Molybdenum	18	99
Barium	26	99	Nickel	15	92
Beryllium	<1	100	Selenium	17	115
Cadmium	15	80	Silver	<1	84
Chromium	22	80	Thallium	<1	125
Cobalt	<1	86	Vanadium	26	92
Copper	13	87	Zinc	9	82
Lead	11	82			

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 14724-7
CLIENT: Harding Lawson Associates
SAMPLE ID: 8899OC02
HLA Job #: 2176,159/163/160.02
HUNTERS POINT

DATE RECEIVED: 05/17/88
DATE ANALYZED: 05/24,27/88
DATE REPORTED: 06/01/88

CAM 17 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	DETECTION LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 7040
Arsenic	69	2.0	EPA 6010
Barium	220	5.0	EPA 7080
Beryllium	ND	0.5	EPA 7090
Cadmium	2.7	0.3	EPA 6010
Chromium (total)	182	0.5	EPA 6010
Cobalt	30	0.5	EPA 6010
Copper	150	0.5	EPA 6010
Lead	41	3.0	EPA 6010
Mercury	ND	0.1	EPA 7470
Molybdenum	10	0.5	EPA 6010
Nickel	340	0.5	EPA 6010
Selenium	97	3.0	EPA 6010
Silver	ND	1.0	EPA 6010
Thallium	ND	3.0	EPA 7840
Vanadium	44	0.5	EPA 6010
Zinc	48	0.5	EPA 6010

ND = None Detected

QA/QC SUMMARY

	%RPD	%SPIKE		%RPD	%SPIKE
Antimony	<1	115	Mercury	<1	105
Arsenic	19	105	Molybdenum	18	99
Barium	26	99	Nickel	15	92
Beryllium	<1	100	Selenium	17	115
Cadmium	15	80	Silver	<1	84
Chromium	22	80	Thallium	<1	125
Cobalt	<1	86	Vanadium	26	92
Copper	13	87	Zinc	9	82
Lead	11	82			

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 14724-8
CLIENT: Harding Lawson Associates
SAMPLE ID: 8899OC03
HLA Job #: 2176,159/163/160.02
HUNTERS POINT

DATE RECEIVED: 05/17/88
DATE ANALYZED: 05/24,27/88
DATE REPORTED: 06/01/88

CAM 17 Metals in Soils & Wastes
Digestion Method: EPA 3050

METAL	RESULT mg/Kg	DETECTION LIMIT mg/Kg	METHOD
Antimony	ND	3.0	EPA 7040
Arsenic	69	2.0	EPA 6010
Barium	84	5.0	EPA 7080
Beryllium	ND	0.5	EPA 7090
Cadmium	2.7	0.3	EPA 6010
Chromium (total)	190	0.5	EPA 6010
Cobalt	32	0.5	EPA 6010
Copper	157	0.5	EPA 6010
Lead	43	3.0	EPA 6010
Mercury	ND	0.1	EPA 7470
Molybdenum	10	0.5	EPA 6010
Nickel	360	0.5	EPA 6010
Selenium	100	3.0	EPA 6010
Silver	ND	1.0	EPA 6010
Thallium	ND	3.0	EPA 7840
Vanadium	46	0.5	EPA 6010
Zinc	44	0.5	EPA 6010

ND = None Detected

QA/QC SUMMARY

	%RPD	%SPIKE		%RPD	%SPIKE
Antimony	<1	115	Mercury	<1	105
Arsenic	19	105	Molybdenum	18	99
Barium	26	99	Nickel	15	92
Beryllium	<1	100	Selenium	17	115
Cadmium	15	80	Silver	<1	84
Chromium	22	80	Thallium	<1	125
Cobalt	<1	86	Vanadium	26	92
Copper	13	87	Zinc	9	82
Lead	11	82			

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14724-6
CLIENT: Harding Lawson Associates
HLA Job Number: 2176,159/163/160.02, H.P.
CLIENT ID: 8899OC01

DATE RECEIVED: 05/17/88
DATE EXTRACTED: 05/23/88
DATE ANALYZED: 05/25/88
DATE REPORTED: 06/01/88

EPA METHOD 8270: BASE/NEUTRAL AND ACID EXTRACTABLES IN SOILS & WASTES
EXTRACTION METHOD: EPA 3550 SONICATION

ACID COMPOUNDS	RESULT mg/kg	LOD mg/kg
Phenol	ND	0.33
2-Chlorophenol	ND	0.33
2-Nitrophenol	ND	1.65
2,4-Dimethylphenol	ND	0.33
2,4-Dichlorophenol	ND	0.33
4-Chloro-3-methylphenol	ND	0.66
2,4,6-Trichlorophenol	ND	0.33
2,4-Dinitrophenol	ND	1.65
4-Nitrophenol	ND	1.65
2-Methyl-4,6-dinitrophenol	ND	1.65
Pentachlorophenol	ND	1.65
BASE/NEUTRAL COMPOUNDS		
Bis(2-chloroethyl)ether	ND	0.33
1,3-Dichlorobenzene	ND	0.33
1,4-Dichlorobenzene	ND	0.33
1,2-Dichlorobenzene	ND	0.33
Bis(2-chloroisopropyl)ether	ND	0.33
N-nitrosodi-n-propylamine	ND	0.33
Hexachloroethane	ND	0.33
Nitrobenzene	ND	0.33
Isophorone	ND	0.33
Bis(2-chloroethoxy)methane	ND	0.33
1,2,4-Trichlorobenzene	ND	0.33
Naphthalene	ND	0.33
Hexachlorobutadiene	ND	0.33
Hexachlorocyclopentadiene	ND	0.33
2-Chloronaphthalene	ND	0.33
Dimethyl phthalate	ND	0.33
Acenaphthylene	ND	0.33
2,6-Dinitrotoluene	ND	0.33
Acenaphthene	ND	0.33
2,4-Dinitrotoluene	ND	0.33
Fluorene	ND	0.33
Diethyl phthalate	ND	0.33
4-Chlorophenylphenyl ether	ND	0.33
N-Nitrosodiphenylamine	ND	0.33
1,2-Diphenylhydrazine	ND	0.33
4-Bromophenylphenyl ether	ND	0.33

LABORATORY NUMBER: 14724-6
CLIENT ID: 8899OC01

BASE/NEUTRAL COMPOUNDS	RESULT mg/kg	LOD mg/kg
Hexachlorobenzene	ND	0.33
Phenanthrene	ND	0.33
Anthracene	ND	0.33
Dibutylphthalate	ND	0.33
Fluoranthene	ND	0.33
Benzidine	ND	1.65
Pyrene	ND	0.33
Butylbenzylphthalate	ND	0.33
Benzo (a) anthracene	ND	0.33
3,3'-Dichlorobenzidine	ND	1.65
Chrysene	ND	0.33
Bis (2-ethylhexyl)phthalate	ND	0.33
Di-n-octyl phthalate	ND	0.33
Benzo (b) fluoranthene	ND	0.33
Benzo (k) fluoranthene	ND	0.33
Benzo (a) pyrene	ND	0.33
Indeno (1,2,3-cd) pyrene	ND	1.65
Dibenzo (a,h) anthracene	ND	1.65
Benzo (ghi) perylene	ND	1.65
HSL COMPOUNDS		
Benzoic Acid	ND	3.3
2-Methylphenol	ND	0.33
4-Methylphenol	ND	0.33
2,4,5-Trichlorophenol	ND	0.33
Aniline	ND	0.33
Benzyl Alcohol	ND	1.65
4-Chloroaniline	ND	0.66
2-Methylnaphthalene	ND	0.33
2-Nitroanline	ND	1.65
3-Nitroaniline	ND	1.65
Dibenzofuran	ND	0.33
4-Nitroaniline	ND	1.65

ND = None Detected, Limit of Detection (LOD) appears in far right column

QA/QC SUMMARY

Compound	%Recovery	Compound	%Recovery
2-Fluorophenol	121	2-Fluorobiphenyl	84
2,4,6-tribromophenol	109	Terphenyl	66
Nitrobenzene-d5	81		

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 14724-7
CLIENT: Harding Lawson Associates
HLA Job Number: 2176,159/163/160.02, H.P.
CLIENT ID: 88990C02

DATE RECEIVED: 05/17/88
DATE EXTRACTED: 05/23/88
DATE ANALYZED: 05/25/88
DATE REPORTED: 06/01/88

EPA METHOD 8270: BASE/NEUTRAL AND ACID EXTRACTABLES IN SOILS & WASTES
EXTRACTION METHOD: EPA 3550 SONICATION

ACID COMPOUNDS	RESULT mg/kg	LOD mg/kg
Phenol	ND	0.33
2-Chlorophenol	ND	0.33
2-Nitrophenol	ND	1.65
2,4-Dimethylphenol	ND	0.33
2,4-Dichlorophenol	ND	0.33
4-Chloro-3-methylphenol	ND	0.66
2,4,6-Trichlorophenol	ND	0.33
2,4-Dinitrophenol	ND	1.65
4-Nitrophenol	ND	1.65
2-Methyl-4,6-dinitrophenol	ND	1.65
Pentachlorophenol	ND	1.65
BASE/NEUTRAL COMPOUNDS		
Bis(2-chloroethyl)ether	ND	0.33
1,3-Dichlorobenzene	ND	0.33
1,4-Dichlorobenzene	ND	0.33
1,2-Dichlorobenzene	ND	0.33
Bis(2-chloroisopropyl)ether	ND	0.33
N-nitrosodi-n-propylamine	ND	0.33
Hexachloroethane	ND	0.33
Nitrobenzene	ND	0.33
Isophorone	ND	0.33
Bis(2-chloroethoxy)methane	ND	0.33
1,2,4-Trichlorobenzene	ND	0.33
Naphthalene	ND	0.33
Hexachlorobutadiene	ND	0.33
Hexachlorocyclopentadiene	ND	0.33
2-Chloronaphthalene	ND	0.33
Dimethyl phthalate	ND	0.33
Acenaphthylene	ND	0.33
2,6-Dinitrotoluene	ND	0.33
Acenaphthene	ND	0.33
2,4-Dinitrotoluene	ND	0.33
Fluorene	ND	0.33
Diethyl phthalate	ND	0.33
4-Chlorophenylphenyl ether	ND	0.33
N-Nitrosodiphenylamine	ND	0.33
1,2-Diphenylhydrazine	ND	0.33
4-Bromophenylphenyl ether	ND	0.33

LABORATORY NUMBER: 14724-7
CLIENT ID: 8899OC02

BASE/NEUTRAL COMPOUNDS	RESULT mg/kg	LOD mg/kg
Hexachlorobenzene	ND	0.33
Phenanthrene	ND	0.33
Anthracene	ND	0.33
Dibutylphthalate	ND	0.33
Fluoranthene	ND	0.33
Benzidine	ND	1.65
Pyrene	ND	0.33
Butylbenzylphthalate	ND	0.33
Benzo (a) anthracene	ND	0.33
3,3'-Dichlorobenzidine	ND	1.65
Chrysene	ND	0.33
Bis (2-ethylhexyl)phthalate	ND	0.33
Di-n-octyl phthalate	ND	0.33
Benzo (b) fluoranthene	ND	0.33
Benzo (k) fluoranthene	ND	0.33
Benzo (a) pyrene	ND	0.33
Indeno (1,2,3-cd) pyrene	ND	1.65
Dibenzo (a,h) anthracene	ND	1.65
Benzo (ghi) perylene	ND	1.65
HSL COMPOUNDS		
Benzoic Acid	ND	3.3
2-Methylphenol	ND	0.33
4-Methylphenol	ND	0.33
2,4,5-Trichlorophenol	ND	0.33
Aniline	ND	0.33
Benzyl Alcohol	ND	1.65
4-Chloroaniline	ND	0.66
2-Methylnaphthalene	ND	0.33
2-Nitroanline	ND	1.65
3-Nitroaniline	ND	1.65
Dibenzofuran	ND	0.33
4-Nitroaniline	ND	1.65

ND = None Detected, Limit of Detection (LOD) appears in far right column

QA/QC SUMMARY

Compound	%Recovery	Compound	%Recovery
2-Fluorophenol	108	2-Fluorobiphenyl	86
2,4,6-tribromophenol	98	Terphenyl	63
Nitrobenzene-d5	81		

LABORATORY NUMBER: 14724-8
CLIENT: Harding Lawson Associates
HLA Job Number: 2176,159/163/160.02, H.P.
CLIENT ID: 8899OC03

DATE RECEIVED: 05/17/88
DATE EXTRACTED: 05/23/88
DATE ANALYZED: 05/25/88
DATE REPORTED: 06/01/88

EPA METHOD 8270: BASE/NEUTRAL AND ACID EXTRACTABLES IN SOILS & WASTES
EXTRACTION METHOD: EPA 3550 SONICATION

	RESULT	LOD
ACID COMPOUNDS	mg/kg	mg/kg
Phenol	ND	0.33
2-Chlorophenol	ND	0.33
2-Nitrophenol	ND	1.65
2,4-Dimethylphenol	ND	0.33
2,4-Dichlorophenol	ND	0.33
4-Chloro-3-methylphenol	ND	0.66
2,4,6-Trichlorophenol	ND	0.33
2,4-Dinitrophenol	ND	1.65
4-Nitrophenol	ND	1.65
2-Methyl-4,6-dinitrophenol	ND	1.65
Pentachlorophenol	ND	1.65
BASE/NEUTRAL COMPOUNDS		
Bis(2-chloroethyl)ether	ND	0.33
1,3-Dichlorobenzene	ND	0.33
1,4-Dichlorobenzene	ND	0.33
1,2-Dichlorobenzene	ND	0.33
Bis(2-chloroisopropyl)ether	ND	0.33
N-nitrosodi-n-propylamine	ND	0.33
Hexachloroethane	ND	0.33
Nitrobenzene	ND	0.33
Isophorone	ND	0.33
Bis(2-chloroethoxy)methane	ND	0.33
1,2,4-Trichlorobenzene	ND	0.33
Naphthalene	ND	0.33
Hexachlorobutadiene	ND	0.33
Hexachlorocyclopentadiene	ND	0.33
2-Chloronaphthalene	ND	0.33
Dimethyl phthalate	ND	0.33
Acenaphthylene	ND	0.33
2,6-Dinitrotoluene	ND	0.33
Acenaphthene	ND	0.33
2,4-Dinitrotoluene	ND	0.33
Fluorene	ND	0.33
Diethyl phthalate	ND	0.33
4-Chlorophenylphenyl ether	ND	0.33
N-Nitrosodiphenylamine	ND	0.33
1,2-Diphenylhydrazine	ND	0.33
4-Bromophenylphenyl ether	ND	0.33

LABORATORY NUMBER: 14724-8
CLIENT ID: 8899OC03

BASE/NEUTRAL COMPOUNDS	RESULT mg/kg	LOD mg/kg
Hexachlorobenzene	ND	0.33
Phenanthrene	ND	0.33
Anthracene	ND	0.33
Dibutylphthalate	ND	0.33
Fluoranthene	ND	0.33
Benzidine	ND	1.65
Pyrene	ND	0.33
Butylbenzylphthalate	ND	0.33
Benzo (a) anthracene	ND	0.33
3,3'-Dichlorobenzidine	ND	1.65
Chrysene	ND	0.33
Bis (2-ethylhexyl)phthalate	ND	0.33
Di-n-octyl phthalate	ND	0.33
Benzo (b) fluoranthene	ND	0.33
Benzo (k) fluoranthene	ND	0.33
Benzo (a) pyrene	ND	0.33
Indeno (1,2,3-cd) pyrene	ND	1.65
Dibenzo (a,h) anthracene	ND	1.65
Benzo (ghi) perylene	ND	1.65
HSL COMPOUNDS		
Benzoic Acid	ND	3.3
2-Methylphenol	ND	0.33
4-Methylphenol	ND	0.33
2,4,5-Trichlorophenol	ND	0.33
Aniline	ND	0.33
Benzyl Alcohol	ND	1.65
4-Chloroaniline	ND	0.66
2-Methylnaphthalene	ND	0.33
2-Nitroanline	ND	1.65
3-Nitroaniline	ND	1.65
Dibenzofuran	ND	0.33
4-Nitroaniline	ND	1.65

ND = None Detected, Limit of Detection (LOD) appears in far right column

QA/QC SUMMARY

Compound	%Recovery	Compound	%Recovery
2-Fluorophenol	56	2-Fluorobiphenyl	90
2,4,6-tribromophenol	98	Terphenyl	88
Nitrobenzene-d5	69		

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 14724-6
CLIENT: HARDING LAWSON ASSOCIATES
SAMPLE ID: 8899OC01
JOB #: 2176,159/163/160.02, HUNTERS POINT

DATE RECEIVED: 05/17/88
DATE EXTRACTED: 05/31/88
DATE ANALYZED: 06/01/88
DATE REPORTED: 06/03/88

EPA 8080: Organochlorine Pesticides and PCBs in Soil & Wastes
Extraction Method: EPA 3580 - Waste Dilution

COMPOUND	Result (mg/kg)	Detection Limit (mg/kg)
alpha-BHC	ND	0.05
beta-BHC	ND	0.05
gamma-BHC	ND	0.05
delta-BHA	ND	0.05
Heptachlor	ND	0.05
Aldrin	ND	0.05
Heptachlor Epoxide	ND	0.05
Endosulfan I	ND	0.05
pp-DDE	ND	0.05
Dieldrin	ND	0.05
Endrin	ND	0.05
Endosulfan II	ND	0.05
pp-DDD	ND	0.05
Endrin Ketone	ND	0.05
Endosulfan Sulfate	ND	0.05
pp-DDT	ND	0.05
Chlordane	ND	0.5
Toxaphene	ND	0.5
Methoxychlor	ND	0.5
PCB 1016	ND	0.5
PCB 1221	ND	0.5
PCB 1232	ND	0.5
PCB 1242	ND	0.5
PCB 1248	ND	0.5
PCB 1254	ND	0.5
PCB 1260	ND	0.5

ND = Not detected. Limit of detection appears right column.

QA/QC:

Duplicate: Relative % Difference	22
Average Spike Recovery %	110

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 14724-7
CLIENT: HARDING LAWSON ASSOCIATES
SAMPLE ID: 88990C02
JOB #: 2176,159/163/160.02, HUNTERS POINT

DATE RECEIVED: 05/17/88
DATE EXTRACTED: 05/31/88
DATE ANALYZED: 06/03/88
DATE REPORTED: 06/03/88

EPA 8080: Organochlorine Pesticides and PCBs in Soil & Wastes
Extraction Method: EPA 3580 - Waste Dilution

COMPOUND	Result (mg/kg)	Detection Limit (mg/kg)
alpha-BHC	ND	0.05
beta-BHC	ND	0.05
gamma-BHC	ND	0.05
delta-BHA	ND	0.05
Heptachlor	ND	0.05
Aldrin	ND	0.05
Heptachlor Epoxide	ND	0.05
Endosulfan I	ND	0.05
pp-DDE	ND	0.05
Dieldrin	ND	0.05
Endrin	ND	0.05
Endosulfan II	ND	0.05
pp-DDD	ND	0.05
Endrin Ketone	ND	0.05
Endosulfan Sulfate	ND	0.05
pp-DDT	ND	0.05
Chlordane	ND	0.5
Toxaphene	ND	0.5
Methoxychlor	ND	0.5
PCB 1016	ND	0.5
PCB 1221	ND	0.5
PCB 1232	ND	0.5
PCB 1242	ND	0.5
PCB 1248	ND	0.5
PCB 1254	ND	0.5
PCB 1260	ND	0.5

ND = Not detected. Limit of detection appears right column.

QA/QC:

Duplicate: Relative % Difference	22
Average Spike Recovery %	110

LABORATORY NUMBER: 14724-8
CLIENT: HARDING LAWSON ASSOCIATES
SAMPLE ID: 8899OC03
JOB #: 2176,159/163/160.02, HUNTERS POINT

DATE RECEIVED: 05/17/88
DATE EXTRACTED: 05/31/88
DATE ANALYZED: 06/01/88
DATE REPORTED: 06/03/88

EPA 8080: Organochlorine Pesticides and PCBs in Soil & Wastes
Extraction Method: EPA 3580 - Waste Dilution

COMPOUND	Result (mg/kg)	Detection Limit (mg/kg)
alpha-BHC	ND	0.05
beta-BHC	ND	0.05
gamma-BHC	ND	0.05
delta-BHA	ND	0.05
Heptachlor	ND	0.05
Aldrin	ND	0.05
Heptachlor Epoxide	ND	0.05
Endosulfan I	ND	0.05
pp-DDE	ND	0.05
Dieldrin	ND	0.05
Endrin	ND	0.05
Endosulfan II	ND	0.05
pp-DDD	ND	0.05
Endrin Ketone	ND	0.05
Endosulfan Sulfate	ND	0.05
pp-DDT	ND	0.05
Chlordane	ND	0.5
Toxaphene	ND	0.5
Methoxychlor	ND	0.5
PCB 1016	ND	0.5
PCB 1221	ND	0.5
PCB 1232	ND	0.5
PCB 1242	ND	0.5
PCB 1248	ND	0.5
PCB 1254	0.7	0.5
PCB 1260	ND	0.5

ND = Not detected. Limit of detection appears right column.

QA/QC:

Duplicate: Relative % Difference	22
Average Spike Recovery %	110

DISTRIBUTION

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Lisa S. Teague
Geologist - 3839